APPENDIX I

GLOSSARY

ALLOWANCE PARTS LIST (APL)—Repair parts required for unit having the equipment/ component listed.

ALLOWANCE EQUIPAGE LIST (AEL)—Equipment requirements for a unit having the exact equipment/component listed.

BEAM-LEAD CHIP—Semiconductor chip with electrodes (leads) extended beyond the wafer.

BONDING WIRES—Fine wires connecting the bonding pads of the chip to the external leads of the package.

BUILT-IN TEST EQUIPMENT (BITE)—Permanently mounted to the equipment for the purpose of testing the equipment.

CABLE HARNESS—A group of wires or ribbons of wiring used to interconnect electronic systems and subsystems.

CATHODE SPUTTERING—Process of producing thin film components.

CERMET—A combination of powdered precious-metal alloys and an inorganic material such as alumina. Used in manufacturing resistors, capacitors, and other components for high-temperature applications.

CORDWOOD MODULE.—A method of increasing the number of discrete components in a given space. Resembles wood stacked for a fireplace.

CRYSTAL FURNACE.—Device for artificially growing cylindrical crystals for producing semi-conductor substrates.

DEPOT-LEVEL MAINTENANCE (SM&R Code D)—Supports S&R Code I and SM&R Code O activities through extensive shop facilities and equipment and more highly skilled personnel.

DICE—Uncased chips.

DIE BONDING—Process of mounting a chip to a package.

DIFFUSION—Controlled application of impurity atoms to a semiconductor substrate.

DISCRETE COMPONENTS—Individual transistors, diodes, resistors, capacitors, and inductors.

DOPING—See Diffusion.

DUAL IN-LINE PACKAGE (DIP)—IC package having two parallel rows of preformed leads.

ENCAPSULATED—Imbedded in solid material or enclosed in glass or metal.

EPITAXIAL PROCESS—The depositing of a thin uniformly doped crystalline region (layer) on a substrate.

EUTECTIC ALLOY—An alloy that changes directly from a solid to a liquid with no plastic or semiliquid state.

EUTECTIC SOLDER—An alloy of 63 percent tin and 37 percent lead. Melts at 361º F.

FILM ICs—Conductive or nonconductive material deposited on a glass or ceramic substrate. Used for passive circuit components, resistors, and capacitors.

FLAT PACK—IC package.

FLIP CHIP—Monolithic IC packaging technique that eliminates need for bonding wires.

FLUX—Removes surface oxides from metals being soldered.

GENERAL PURPOSE ELECTRONIC TEST EQUIPMENT (GPETE)—Multimeters, oscilloscopes, voltmeters, signal generators, etc.

GROUND PLANES—Copper planes-used to minimize interference between circuits and from external sources.

HYBRID ICs—Two or more integrated circuit types, or one or more integrated circuit types and discrete components on a single substrate.

INTEGRATED CIRCUIT (IC)—Elements inseparably associated and formed on or within a single substrate.

INTERMEDIATE-LEVEL MAINTENANCE (SR&R Code I)—Direct support and technical assistance to user organizations. Tenders and shore-based repair facilities.

ISOLATION—The prevention of unwanted interaction or leakage between components.

LANDS—Conductors or runs on pcbs.

LARGE SCALE INTEGRATION (lsi)—An integrated circuit containing 1,000 to 2,000 logic gates or up to 64,000 bits of memory.

MASK—A device used to deposit materials on a substrate in the desired pattern.

MICROCIRCUIT—A small circuit having high equivalent-circuit-element density, which is considered as a single part composed of interconnected elements on or within a single substrate to perform an electronic-circuit function.

MICROELECTRONICS—That area of electronics technology associated with electronic systems built of extremely small electronic parts or elements.

MICROCIRCUIT MODULE—An assembly of microcircuits or a combination of microcircuits and discrete components that perform one or more distinct functions.

MODIFIED TRANSISTOR OUTLINE (TO)—IC package resembling a transistor.

MODULAR PACKAGING—Circuit assemblies or subassemblies packaged to be easily removed for maintenance or repair.

MODULE—A circuit or portion of a circuit packaged as a removable unit. A separable unit in a packaging scheme displaying regularity of dimensions.

MILITARY STANDARDS (MILSTD)—Standards of performance for components or equipment that must be met to be acceptable for military systems.

MINIATURE ELECTRONICS—Modules, packages, pcbs, and so forth, composed exclusively of discrete components.

2M—Miniature/Microminiature repair program.

MONOLITHIC IC—ICs that are formed completely within a semiconductor substrate. Silicon chips.

OFF-LINE TEST EQUIPMENT—Tests andisolates faults in modules or assemblies removed from systems.

OHMS PER SQUARE—The resistance of any square area of thin film resistive material as measured between two parallel sides.

ON-LINE TEST EQUIPMENT—Continuously monitors the performance of electronic systems.

ORGANIZATIONAL-LEVEL MAINTENANCE (SM&R Code O)—Responsibility of the user organization.

PACKAGING LEVELS—System developed to assist maintenance personnel in isolating faults.

PHOTO ETCHING—Chemical process of removing unwanted material in producing printed circuit boards.

POINT-TO-POINT WIRING—Individual wires run from terminal to terminal to complete a circuit.

PRINTED CIRCUIT BOARD (peb)—The general term for completely processed printed circuit or printed wiring configurations. It includes single-layered, double-layered, and multi-layered boards.

SCREENING—Process of applying nonconductive or semiconductive materials to a substrate to form thick film components.

SHIELDING—Technique designed to minimize internal and external interference.

SOURCE, MAINTENANCE, AND RECOVER-ABILITY CODES (SM&R CODES)—Specify maintenance level for repair of components or assemblies.

SUBSTRATE—Mounting surface for integrated circuits. May be semiconductor or insulator material depending on type of IC.

THICK FILM COMPONENTS—Passive circuit components (resistors and capacitors) having a thickness of 0.001 centimeter.

THIN FILM COMPONENTS—Passive circuit elements (resistors and capacitors) deposited on a substrate to a thickness of 0.0001 centimeter.

VACUUM EVAPORATION—Process of producing thin film components.

VERY LARGE SCALE INTEGRATION (vlsi)—An integrated circuit containing over 2,000 logic gates or 64,000 bits of memory.

WAFER—A slice of semiconductor material upon which monolithic ICs are produced.

APPENDIX II

REFERENCE LIST

CHAPTER ONE

Linear Integrated Circuits, Basic Electricity and Electronics Course, Module 34, CANTRAC A-100-0010, Naval Education and Training Program Development Center Detachment, Great Lakes, III., 1981.

Technical Manual, Miniature/Microminiature (2M) Electronic Repair Program, Vols. I, II, and III, NAVSEA TE000-AA-HBK-010/020/030/2M, Naval Sea Systems Command, Keyport, Wash., 1982.

CHAPTER 2

Technical Manual, Miniature/Microminiature (2M) Electronic Repair Program, Vols. I, II, and III, NAVSEA TE000-AA-HBK-010/020/030/2M, Naval Sea Systems Command, Keyport, Wash., 1982.

CHAPTER 3

General Maintenance Handbook, Electronics Installation and Maintenance Books, NAVSEA SE000-00-EIM-160, Naval Sea Systems Command, Washington, D.C., 1981.

Technical Manual, Miniature/Microminiature (2M) Electronic Repair Program, Vols. I, II, and III, NAVSEA TE000-AA-HBK-010/020/030/2M, Naval Sea Systems Command, Keyport, Wash., 1982.

MODULE 14 INDEX

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